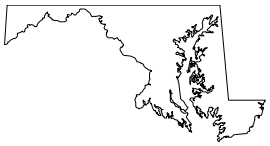

PUBLIC HEALTH INFRASTRUCTURE

Focus Area 1 - Improving Access to Health Data

Problem

The introduction of desktop computing, telecommunication networks, and the Internet are influencing the manner in which public and private health practitioners collect, access, and use data. The improvements in technologies result in the collection of more data that can be valuable for all health professionals, both public and private, if the data are accessible. Previously, data timeliness was limited by the lack of effective automation and the lack of effective telecommunications. The Department of Health and Mental Hygiene is expanding its Wide Area Network (WAN) throughout the state to each county to provide greater access to available information for all health professionals. In addition to the expansion of telecommunications capability, new methods for identifying sources of data, integrating data when appropriate, and ways for improving the timeliness and integrity of data are also needed. Training in data interpretation and use must be readily available to relevant staff.

Scope of the problem

The WAN in the Department of Health and Mental Hygiene (DHMH) includes a firewall to connect the Department's private secured WAN to the Internet for communications with most public and private health and medical organizations. At the end of 2000, all except three of 24 counties had at least one building connected to the Department's WAN. Also, there were approximately 90 sites that were not connected to the Department's WAN, in which public health staff are located. This leaves many health professionals without adequate means to access essential health data needed to make timely informed decisions.

Over the past decade, a number of automated data systems were developed, primarily using legacy mainframe technology. Although most public health staff have access to the mainframe computer and to the various existing data systems, no effective means exist to integrate the data from multiple systems. Most of the systems were developed independently, resulting in the lack of data standards, duplicative data, redundant processes, and, generally, an overall ineffective environment for making the most effective use of existing information. Many of the old data systems should be replaced or combined where appropriate. Data standards will be necessary in order to integrate data across systems. New access and reporting methods, including geographic information systems (GIS) should be introduced to help provide a more effective environment for analysis of multiple data sets.

A more effective educational program for health professionals is needed throughout the State and for local health organizations. Limited training and educational opportunities in the rural areas of the State are educational impediments for health professionals. Continuing education is a requirement for many health professionals, but the distance between their working location and the institutions that provide the necessary training and education creates an enormous burden. Many training and educational opportunities can be expanded through distance education technologies, such as the Internet, compressed video teleconferencing, and satellite broadcast.

Resources are the primary obstacles. In the future, additional equipment and software will be required for connecting all staff to the DHMH WAN and for the processing and storage of data. New data systems should be developed, which will require the assistance of contracted systems development staff. An extensive training program will be needed to ensure that all employees make the most effective use of new technologies for access and use of the new data systems. Existing budgets do not include sufficient funds to attain all the desired goals. Future budgets may also be insufficient. Consequently, other sources of funds should be identified.

Objective 1 - By 2005, all DHMH public health staff at headquarters and in local health departments will have direct access to public health information via the DHMH WAN and the Internet.

Action Steps

- ⇨ Develop an action plan that identifies the components for full connectivity for all headquarters and local health department professional staff.
- ⇨ Identify sources of funding needed to provide full connectivity throughout the Department.
- ⇨ Acquire and install necessary, dedicated telecommunications lines, equipment and software. Hire additional support staff.
- ⇨ Train all professional staff in the use of the Internet and other new telecommunications capabilities.

Objective 2 - By 2005, the Department of Health and Mental Hygiene will take advantage of the growing use of electronic information technology to enable State and local health department staff to accomplish their mission.

Action Steps

- ⇨ Promote the value of electronic public health information.

- ⇨ Promote education in the use of methods to protect privacy and confidentiality of electronic information.

- ⇨ Implement security technologies necessary for the protection of public health data.

- ⇨ Convene a data standards user group to develop data standards and parameters for presentation of data online.

- ⇨ Investigate new technologies for improving the timeliness, accuracy, and accessibility of public health information. Develop pilot projects using new technologies.

Objective 3 - By 2003, complete the establishment of the first phase of the effort begun under the Public Health Data Network (PHDN) initiative for building an integrated data system in Maryland.

Action Steps

- ⇨ Complete the development of the Public Health Data Network (PHDN) core system.

- ⇨ Continue the effort of the PHDN Task Force to identify additional data requirements for inclusion in the data warehouse.

- ⇨ Develop processes to assure and improve timeliness and availability of data.

- ⇨ Supplement on-line access with timely production and dissemination of printed reports of data in similar format.

- ⇨ Augment the system to include a capability to automatically extract data for presentation on the Department's Internet Web pages.

- ⇨ Support collaboration of the Office of Public Health Assessment, in CPHA, with other state agencies to establish an integrated Web-based information system.

- ⇨ Construct Web-based access to information such as vital statistics, hospital discharge data and Behavioral Risk Factor Surveillance.

- ⇨ Establish a formal training program for users of the data warehouse capabilities.

Objective 4 - By 2005, develop a centralized geographic information system (GIS) capability within DHMH headquarters.

Action Steps

- ⇨ Identify technical components for a GIS.
- ⇨ Ensure that necessary standardized geographic identifiers are embedded in all data systems.
- ⇨ Provide training to technical staff in the use of the GIS technology.
- ⇨ Acquire necessary software.
- ⇨ Build processes to extract data from data systems for presentation via the Intranet and Internet.

Objective 5 - By 2005, expand the existence and use of distance learning technology, including a combination of compressed video teleconferencing systems, satellite receivers, and Internet-based education programs, at State and local health departments.

Action Steps

- ⇨ Determine the existing distance learning resources available at DHMH headquarters and all local health departments and clinics.
- ⇨ Ensure that at least 50% of all local health departments have at least one dedicated room with standardized distance learning equipment.
- ⇨ Initiate negotiations with the University of Maryland, University College, to promote the development of Internet-based professional educational programs.
- ⇨ Identify new sources of funding for acquiring additional satellite dishes and compressed video teleconferencing equipment.
- ⇨ Work with community colleges, other State agencies, and county governments to identify existing distance learning equipment available for use by public health professionals.

Objective 6 - By 2005, develop minimal standards for analytic capacity required for State and local health departments.

Action Steps

- ⇨ Identify existing analytic knowledge and expertise among LHD staff.
- ⇨ Develop standards for epidemiological and biostatistical capacity at the local and State level.
- ⇨ Identify methods to obtain necessary technical support to provide core analytic capabilities:
  - ❖ Hire new staff;
  - ❖ Train current staff; and
  - ❖ Develop framework for sharing epidemiological and biostatistical support among contiguous counties.

Objective 7 - By 2005, increase training options in computer information technology, biostatistics, and epidemiology for health professionals at State and local agencies.

Action Steps

- ⇨ Convene a committee to identify and document continuing education needs for public health professionals.
- ⇨ Establish formal associations with relevant local academic institutions for training options.
- ⇨ Provide field placement options in local and State health facilities with appropriate supervision for practical experience.
- ⇨ Establish a formal distance learning educational program for public health professionals throughout the State.

Focus Area 2 - Ensuring an Adequate Public Health Workforce

Definition

The Public Health Functions Steering Committee, established by the Public Health Service's Office of Disease Prevention and Health Promotion, defines the public health workforce as "all those providing essential public health services, regardless of the nature of the employing agency." The Committee also noted that provision of these essential services requires collaboration among an array of public and private partners. The *Public Health in America* statement includes a list of the essential public health services:

Public Health in America

Vision: Healthy People in Healthy Communities

Mission: Promote Physical and Mental Health and Prevent Disease, Injury, and Disability

Public Health

- Prevents epidemics and the spread of disease
- Protects against environmental hazards
- Prevents injuries
- Promotes and encourages healthy behaviors
- Responds to disasters and assists communities in recovery
- Assures the quality and accessibility of health services

Essential Public Health Services

- Monitor health status to identify community health problems
- Diagnose and investigate health problems and health hazards in the community
- Inform, educate, and empower people about health issues
- Mobilize community partnerships to identify and solve health problems
- Develop policies and plans that support individual and community health efforts
- Enforce laws and regulations that protect health and ensure safety
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable
- Assure a competent public health and personal health care workforce
- Evaluate effectiveness, accessibility, and quality of personal and population-based health services
- Research for new insights and innovative solutions to health problems

Source: Public Health Function Steering Committee. *Public Health in America*, Fall 1994. Available: http://www.health.gov/phfunctions/public.htm (January 1, 2000).

Problem

The public health workforce will play a critical role in achieving the vision of "healthy people in healthy communities." An adequate supply of competently prepared health professionals is needed to address a growing array of complex challenges to the public's health. Maryland currently lacks a comprehensive plan to assure an adequate statewide supply of needed professionals in public health agencies responsible for the roles encompassed in the *Public Health in America* statement.

Determinants

The work of promoting and protecting the public's health is carried out by health care and other professionals in a variety of organizational settings. The principal public health agencies in Maryland are the state and local health departments. Other public agencies, including agriculture, environment, and education, also participate in this work. Additionally, a growing number of private sector entities are involved; among these are managed care organizations, hospitals, nonprofit corporations, schools, faith organizations, and many businesses. Some of the principal classifications of health workers currently being monitored by the federal government are listed in the chart below. This list does not include every occupational title and category of health professional used in all public health settings. Assuring an appropriately trained and adequate supply of these and other needed health professionals for Maryland will require an approach that incorporates delineation of the workforce composition, competency enhancement, and promoting the education/training infrastructure.

Selected Health and Related Professional Occupations included in the Standard Occupational Classification (SOC) System

- Clinical Counseling & School Psychologist
- Dental Hygienist
- Dentist
- Dietician & Nutritionist
- Emergency Management Specialist
- Environmental Engineering Technician
- Environmental Engineer
- Environmental Scientist
- Environmental Science Technician
- Epidemiologist
- Health Diagnosing and Treating Practitioner
- Health Educator
- Health Technologist/Technician
- Life, Physician, and Social Scientist/Technician
- Medical & Health Services Manager
- Medical & Public Health Social Worker
- Mental Health Counselor
- Mental Health & Substance Abuse Social Worker
- Occupational Health & Safety Specialist
- Occupational Health & Safety Technician
- Pharmacist
- Physician
- Registered Nurse
- Secondary Health Specialist Teacher
- Social & Community Service Manager
- Substance Abuse & Behavior Disorder Counselor
- Veterinarian

Source: Office of Management and Budget. 1998 Standard Occupational Classification. *Federal Register*, September 30, 1999.

Workforce composition

The number, distribution, and disciplines of public health workers required varies across settings depending on community need, legal requirements, and available financial and other resources. Workforce plans can help to determine the capacity of needed professionals and skills required to address identified needs. Historically, assessment of need/demand for physicians has been the primary focus of workforce requirement analysis. One example is a methodology developed by the Public Health Service that is used to determine adequacy of physician supplies in areas proposed for designation as Health Professional Shortage Areas (HPSAs). Similar methodologies assess adequacy for several other health professionals including dentists, psychiatrists, veterinarians, and ophthalmologists. Although these methodologies have been in place for a number of years, there is a growing recognition of their limitations, such as adjustments for subspecialties within a particular professional classification. The federal government, through the Public Health Service's Bureau of Health Professions, is improving methods to assess adequacy and project requirements for a variety of health care professionals, including allied health and public health workers.

These efforts are being done in coordination with a number of states around the country. Use of a standardized taxonomy to categorize and classify public health personnel will support these collaborative efforts. The Standard Occupational Classification (SOC) System, used by all federal agencies that collect occupational data, includes a broad (but not exhaustive) array of public health professionals. Voluntary adoption and use of the SOC System to enable data collection at more detailed levels is recommended in the Healthy People 2010 chapter on public health infrastructure for state and local, public and private sector employers, and other organizations.

Comprehensive planning for workforce needs--in the overall Maryland health care system or within the state and local public health agency subset--requires accurate data to delineate the size and distribution of existing supplies. In Maryland, mechanisms have been developed to collect data suitable for workforce monitoring, in coordination with the licensure process for at least two categories of health professionals, physicians and nurses. Development of similar mechanisms for data collection of other categories of health professionals would provide a useful basis for monitoring these professionals. Profiles of each category of health professional monitored could be compiled. Analysis of these profiles could be used to inform workforce needs assessment, policy decisions, and other aspects of overall comprehensive workforce planning. Assessment of skills needed for a particular occupational setting is an additional required dimension of effective workforce monitoring.

Competency Enhancement

A variety of skills are needed to implement the essential public health functions outlined in the *Public Health in America* statement. These functions include: monitoring health status; informing, educating, and empowering people; mobilizing community partnerships; developing policies and plans; enforcing laws and regulations; linking people to needed services; conducting evaluations; and conducting research. To carry out these responsibilities, public health workers must have a basic knowledge of public health and related expertise. Additionally, in order to

effectively respond to the increasing, myriad changes in the health care marketplace and multi-factorial health problems, public health workers must also be competent in a growing number of cross-cutting technical skills and abilities. Effective program planning, service delivery, and evaluation require skills in specialties such as biostatistics, epidemiology, informatics, and environmental health, as well as the social and behavioral sciences. To effectively identify and address disparities and diversity among population subgroups -- ethnic, cultural, and demographic -- today's public health workforce must also possess an appropriate level of cultural and linguistic competencies.

Education and training infrastructure

Maryland is fortunate to have a number of institutions of higher learning -- including graduate schools of public health, colleges, and universities -- in locations around the State with established programs in areas of needed expertise. A systematic effort to support skills development and renewal, beyond those required by the relevant, discipline-specific licensure/certification process, for public health professionals could be developed in coordination with these institutions. Expansions in technology are yielding mechanisms, including video-conferencing and Internet based distance teaching, that increase the options for convenient and on-the-job training closer to the work-site. These options hold great promise for reducing costs and improving access to needed, continuing education and desirable skill building opportunities.

Objective 1 - Workforce Composition: By 2010, establish the capacity to monitor and plan for statewide need of a minimum set of public health worker classifications in the Department of Health and Mental Hygiene. (Baseline 2000: monitoring and planning capacity for zero classifications)

Action Steps

⇨ Convene an advisory committee, with broad representation among public and private stakeholders, to oversee comprehensive public health workforce monitoring, including:

- ❖ Designation of a division within the DHMH central office programs to assume responsibility for public health workforce monitoring and planning;
- ❖ Assurance of adequate funding for DHMH central office capacity needed to begin comprehensive and systematic monitoring of Maryland's public health workforce requirements;
- ❖ Promotion of collaboration of efforts to develop data collection for workforce monitoring in coordination with existing licensure processes for health professionals on a prioritized basis; and
- ❖ Development of a methodology to assess need for selected categories of health professionals on a prioritized basis.

Objective 2 - Workforce Competency: By 2010, establish standards in the Department of Health and Mental Hygiene (DHMH) for certification of a minimum set of public health worker classifications used in state and local health departments. (Baseline 2000: standards for 0 classifications)

Action Steps

⇨ The Workforce Advisory Committee will coordinate efforts to:

- ❖ Identify the core competencies needed to assure effective delivery of public health services in the state and local health departments;
- ❖ Develop criteria to assess the competency adequacy among the categories of public health workers in state and local health departments; and
- ❖ Coordinate collaborations with relevant public and private stakeholders.

Objective 3 - Workforce Education and Training: By 2010, the Workforce Advisory Committee should oversee development of a mechanism to assure ongoing capacity of public health skills training for at least 25 percent of a targeted set of public health workforce deployed in local health departments. (Baseline 2000: developmental)

Action Steps

⇨ Assess the availability of ongoing public health skills training in local health departments.

⇨ Identify innovative options to provide convenient (locally-based) and affordable professional development opportunities, including continuing education, around the state.

⇨ Identify funding resources for expansions in options for professional education programs.

⇨ Promote collaboration of higher education institutions (including community colleges) with local communities to address needed public health workforce development options.

⇨ Increase options for workshops, public health grand rounds, seminars, and other in-service training options for practicing public health professionals, using distance learning technologies and formats.

⇨ Continue and expand internship and other field training options in the state and local health departments.

Partners

Information Resources Management Administration, DHMH • Maryland Association of County Health Officers • Maryland Department of Budget Management, Personnel Division • Maryland Department of Health and Mental Hygiene (DHMH) • Maryland Local Health Departments • Maryland Public Health Association • Office of Health Policy, DHMH • Office of Public Health Assessment, DHMH

References

Centers for Disease Control and Prevention, Public Health Practice Program Office. *A Decade of Achievement and Service, 1988-1998.*

Public Health Functions Steering Committee. (1994, Fall). *Public health in America*.

U.S. Department of Health and Human Services. (2000). *Healthy people 2010.* Washington, DC: U.S. Department of Health and Human Services, U.S. Government Printing Office.

U. S. Department of Health and Human Services, U.S. Public Health Service. (1997). *The public health workforce: An agenda for the 21st century*. Washington DC: U.S. Department of Health and Human Services.

U. S. Department of Health and Human Services, U.S. Public Health Service. (1998). *United States Health Workforce Personnel Factbook*. Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services.

Vanselow, N.A. (2000). Health workforce planning in the United States. In Gary L. Filerman (Ed.), *NIS/US health workforce planning 2000*. American International Health Alliance (AIHA) and the Association of Academic Health Centers (AHC). Available: http://www.aiha.com/english/pubs/tashkent/vanselow.htm.

Cross-Reference Table for Public Health Infrastructure

See Also

Harford County 211
Prince George's County 245